

IN THE CLAIMS

Please amend claim 1 as follows:

1. (Amended) A method of manufacturing a component of a droplet deposition apparatus, the component comprising a body and a base, the body comprising piezoelectric material having a plurality of channels each with a channel surface, the body being attached to a surface of the base which is free of substantial discontinuities; the method comprising the steps of attaching the body to said surface of the base; and depositing a layer of conductive material so as to extend continuously over at least one of said channel surfaces and said surface of the base to provide an electrode on each channel surface and a conductive track on said surface of the base which is integrally connected to the electrode.



REMARKS

Claims 1-25 were pending in the action. By this paper, claims 1-15 and 23-25 remain pending, claims 16-22 have been canceled without prejudice, and claim 1 has been amended herein. Reconsideration and withdrawal of the objections and rejections are hereby respectfully solicited in view of the foregoing amendments and the following remarks.

Objections to the Abstract

The abstract has been objected to for not pertaining to the elected method claims. The abstract has been amended herein to comply with MPEP §608.1(b). The objection is believed to be overcome.

Objections to the Specification

The specification has been objected to for a number of reasons. First, the title of the invention is objected to for not describing the claimed subject matter. The title of the invention has been amended herein to reflect the subject matter of the elected method claims. This objection is believed to be overcome.

The specification has been objected to for not including proper headings. Headings have been added herein. This objection is believed to be overcome.

Claim Rejections - 35 U.S.C. §112

Claims 1-15 and 23-25 have been rejected under §112, second paragraph, as indefinite. Specifically, the action addresses the "channel surface" recitations and believes the recitations are unclear as to how many channel surfaces are being claimed.

The applicant believes these recitations to be clear and definite in the eyes of one having ordinary skill in the art. Claim 1 has been amended merely to move the "base" recitation to clarify that the component has a body and a base. Claim 1 recites the "body of piezoelectric material having *a plurality of channels each with a channel surface*". Claim 1 was and remains clear that the body has a plurality of channels, thus, inherently requiring a plurality of *channel surfaces* because each of the plurality of channels has one channel surface. The reference to "*at least one of said channel surfaces*" is, thus, also clear because there are a plurality of said channel surfaces.

The rejection under §112 is believed to be overcome in view of the foregoing remarks and the clarifying amendments to claim 1. No new matter has been entered and claim 1 has not been narrowed.

Claim Rejections - 35 U.S.C. §102

Claims 1-4, 6-8, 10-15, 23, and 24 have been rejected under §102(b) as anticipated by EP 0 839 656 (EP '656). Claim 1 recites that the method of forming the component comprises the steps of attaching the body to a surface of the base and depositing a layer of conductive material to form an electrode that extends continuously over *both* at least one of the plurality of channel surfaces in the body and the surface of the base to which the body is attached.

Figures 17(A)-17(H) of EP '656 noted in the action do not disclose this recited method. Instead, a body of piezoelectric material 2 is provided that has a coating of tantalum provided on its top and bottom surfaces to form two electrodes 8 and 9. See col. 13, lines 48-58 in EP '656. A gold pad 10 is subsequently formed. The piezoelectric material is subsequently attached to a base 4 and only then are channels formed.

In contrast to the method of claim 1, EP '656 discloses no deposition steps after formation of the channels. Consequently, there can be no electrodes deposited or otherwise provided *on a surface of channels*. Similarly, since there are no deposition steps after the

channels are formed in EP '656, *it is not possible* to form a layer that extends continuously over at least one of said channel surfaces and said surface of the base.

One of the aims of the present invention is to provide a simplified technique of reliably and efficiently establishing electrical connection between the ink channel electrodes and the corresponding pins of the integrated circuit. The invention recited in claim 1 includes depositing the tracks and electrodes located on a channel surface in a continuous layer. This novel solution is not taught or suggested in EP '656. To illustrate, EP '656 must utilize the gold pad 10 and the wire bonds 17 shown in Figure 17(G).

EP '656 fails to teach or suggest all of the limitations of claim 1. Thus, claim 1 and its corresponding dependent claims 2-4, 6-8, 10-15, 23, and 24 are neither anticipated nor rendered obvious by EP '656.

x (The action also makes specific reference to claims 6, 14, and 15 as being anticipated by EP '656. Regarding claim 6, the action states that the "land" is the material removed from the body 2 and the electrodes 8 and 10 in EP '656. This is incorrect. In claim 6, the land is clearly defined as being located *on the body and between adjacent or neighboring channels*. In figure 17 of EP '656 the portion of material removed on the piezoelectric body, which defines the electrode material of 8a, 8b, and 8c and 10a, 10b, and 10c, is not so located.

Claim 14 recites chamfering the body adjacent the base *to provide regions of the deposited layer of conductive material which overlie the body and the base respectively*, and which meet at an obtuse angle. In contrast, the "chamfer" of the body in EP '656 referred to in the action is merely the end of the ejection channel. While it is true that the body 2 and the base 4 may join at an obtuse angle at that point in EP '656, claim 14 also requires that it is the deposited layer of conductive material that meets and defines an obtuse angle. This is not so in EP '656.

Claim 15 recites attaching the body to the base through adhesive, there being defined between the body and the base *a fillet of said adhesive which serves as a key for the deposited layer of conductive material*. Though EP '656 may disclose an adhesive used to adhere the base and the body therein, the adhesive does not serve as a key for a deposited layer of conductive material. This is because no such material is deposited onto the adhesive in EP '656.

Again, claims 1-4, 6-8, 10-15, 23, and 24 are neither anticipated nor rendered obvious by the teachings of EP '656.

Claim Rejections - 35 U.S.C. §103


Claims 5, 9, and 25 have been rejected under §103(a) as obvious over EP '656 in view of Yasuda et al., U.S. Patent No. 5,347,712 (Yasuda). Yasuda fails to teach or suggest the same limitations discussed above that are missing in EP '656, and the action has made no such allegation. Thus, a combination of EP '656 and Yasuda fail to disclose or suggest all of the limitations of claim 1 and corresponding dependent claims 5, 9, and 25. These claims are also believed to be in condition for allowance.

CONCLUSION

Claims 1-15 and 23-25 are believed to be in condition for allowance based on the foregoing amendments and remarks. Reconsideration and withdrawal are hereby solicited and allowance of these claims is requested.

The examiner is invited to contact the undersigned at the telephone number listed below in order to discuss any remaining issues or matters of form that will place this case in condition for allowance.

Respectfully submitted,

By: 
Bryan J. Lempia
Reg. No. 39,746
MARSHALL, GERSTEIN & BORUN
233 S. Wacker Dr.
6300 Sears Tower
Chicago, Illinois 60606
(312) 474-6300

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VERSION SHOWING CHANGES MADE

In the Specification

Please amend the specification as follows:

At page 1, delete the title of the invention, and substitute the following new title and heading:

-- A Method of Making a Droplet Deposition Apparatus.

Related Application Data --.

At page 1, immediately prior to line 1, please add the following heading:

-- Field of the Invention --.

At page 1, between lines 3 and 4, please add the following heading:

-- Background of the Invention --.

At page 2, immediately before line 1, please add the following heading:

-- Summary of the Invention --.

At page 2, between lines 25 and 26, please add the following heading:

-- Brief Description of the Drawings --.

At page 3, between lines 18 and 19, please add the following heading:

-- Detailed Description of the Preferred Embodiments --.

In the Abstract

Please delete the abstract that was added by preliminary amendment, and substitute a new abstract as follows:

--A method of manufacturing an ink jet print head includes the steps of bonding a body of piezoelectric material to a base plate and cutting channels into the piezoelectric material to form ink chambers which are actuated by applying voltages to electrodes provided on surfaces of the chambers. The base plate carries IC's which contain the drive circuitry for actuating the ink chambers. To ensure reliable electrical connection between the chamber electrodes and the IC's, the electrodes and conducting tracks on the base plate are formed in a single step by depositing a conductive layer over both the PZT body and the base plate. A step of masking or selective removal of material may be performed to achieve the necessary patterning of the electrodes and tracks.--.

In the Claims

Please amend claim 1 as follows:

1: (Amended) A method of manufacturing a component of a droplet deposition apparatus, the component comprising a body and a base, the body comprising [of] piezoelectric material having a plurality of channels each with a channel surface [and a base], the body being attached to a surface of the base which is free of substantial discontinuities; the method comprising the steps of attaching the body to said surface of the base; and depositing a layer of conductive material so as to extend continuously over at least one of said channel surfaces and said surface of the base to provide an electrode on each channel surface and a conductive track on said surface of the base which is integrally connected to the electrode.